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SLIDES: Environmental Water in Australia

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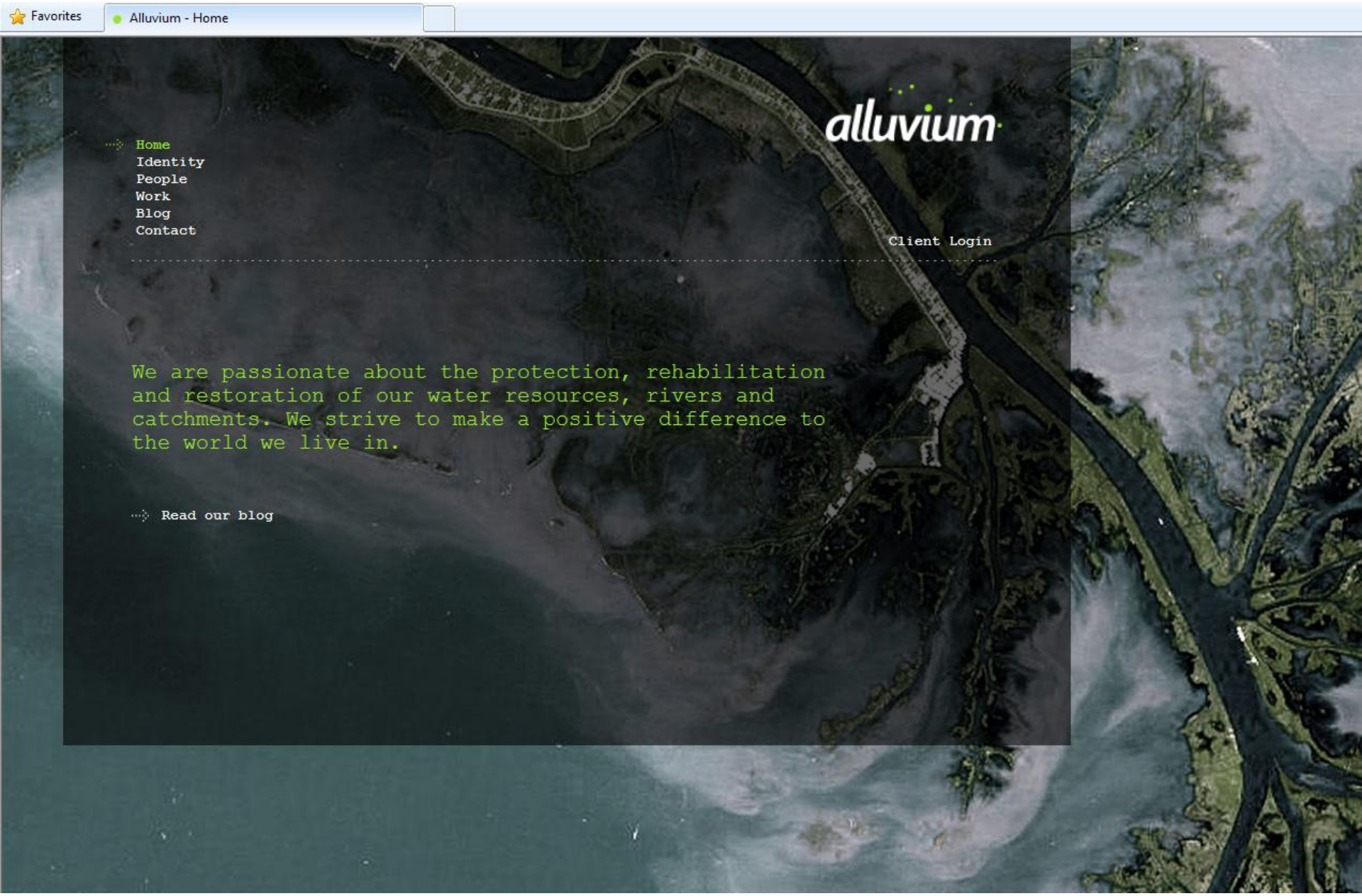
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We are passionate about the protection, rehabilitation and restoration of our water resources, rivers and catchments. We strive to make a positive difference to the world we live in.
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Environmental water in Australia

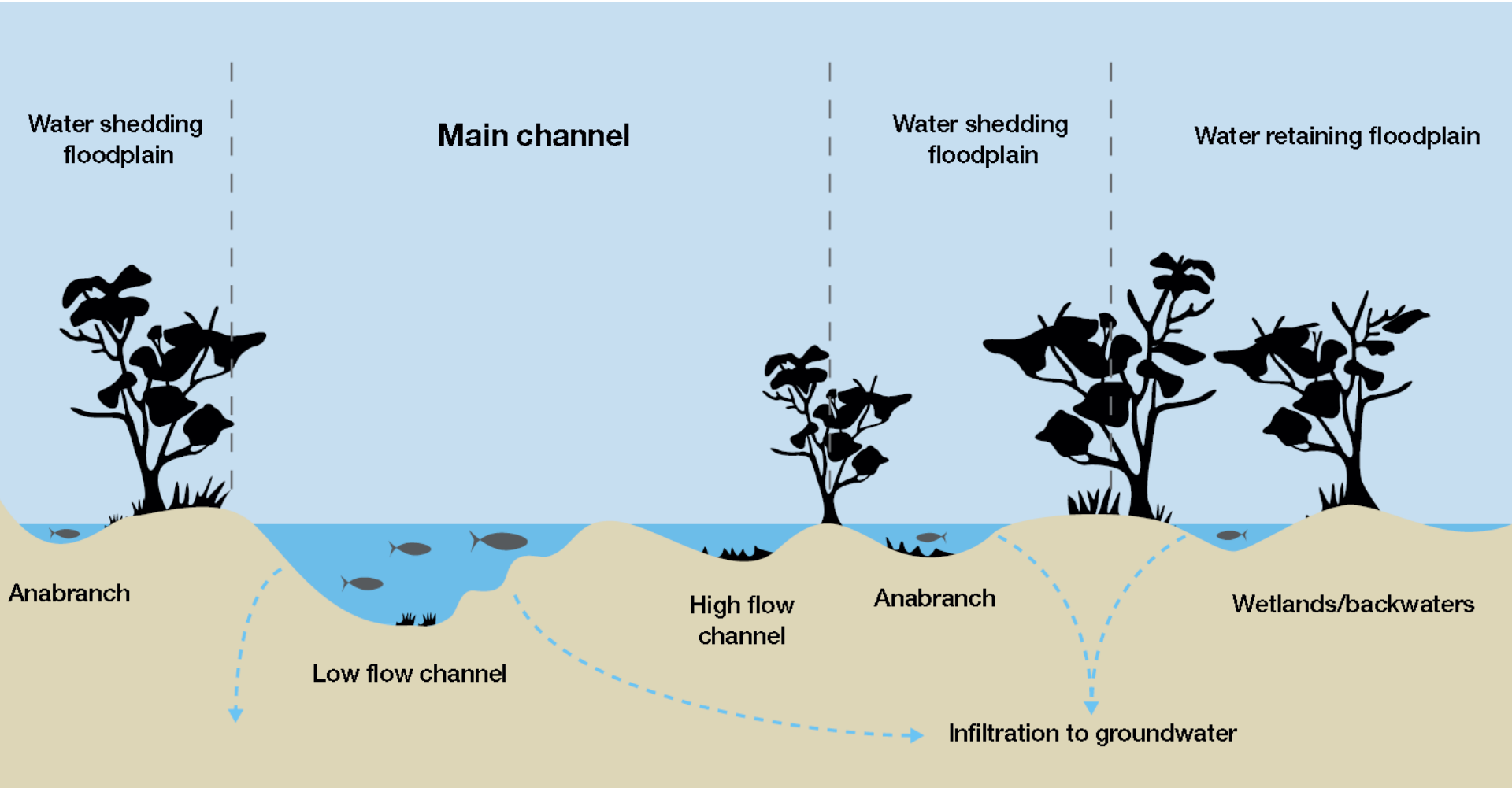
1. The Australian context
2. Our approach to environmental water management
3. Climate change & the way forward

Old,
stable,
flat,
arid

Mississippi versus Murray

	Mississippi	Murray
Length	2,320 km	2,375 km
Watershed	2,981,076 km^2	1,061,469 km^2
Discharge per year	12,743 m^3/s	767 m^3 6% of Mississippi

Floodplain systems



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The Australian approach

A) The Australian Environmental Water Management Report 2010

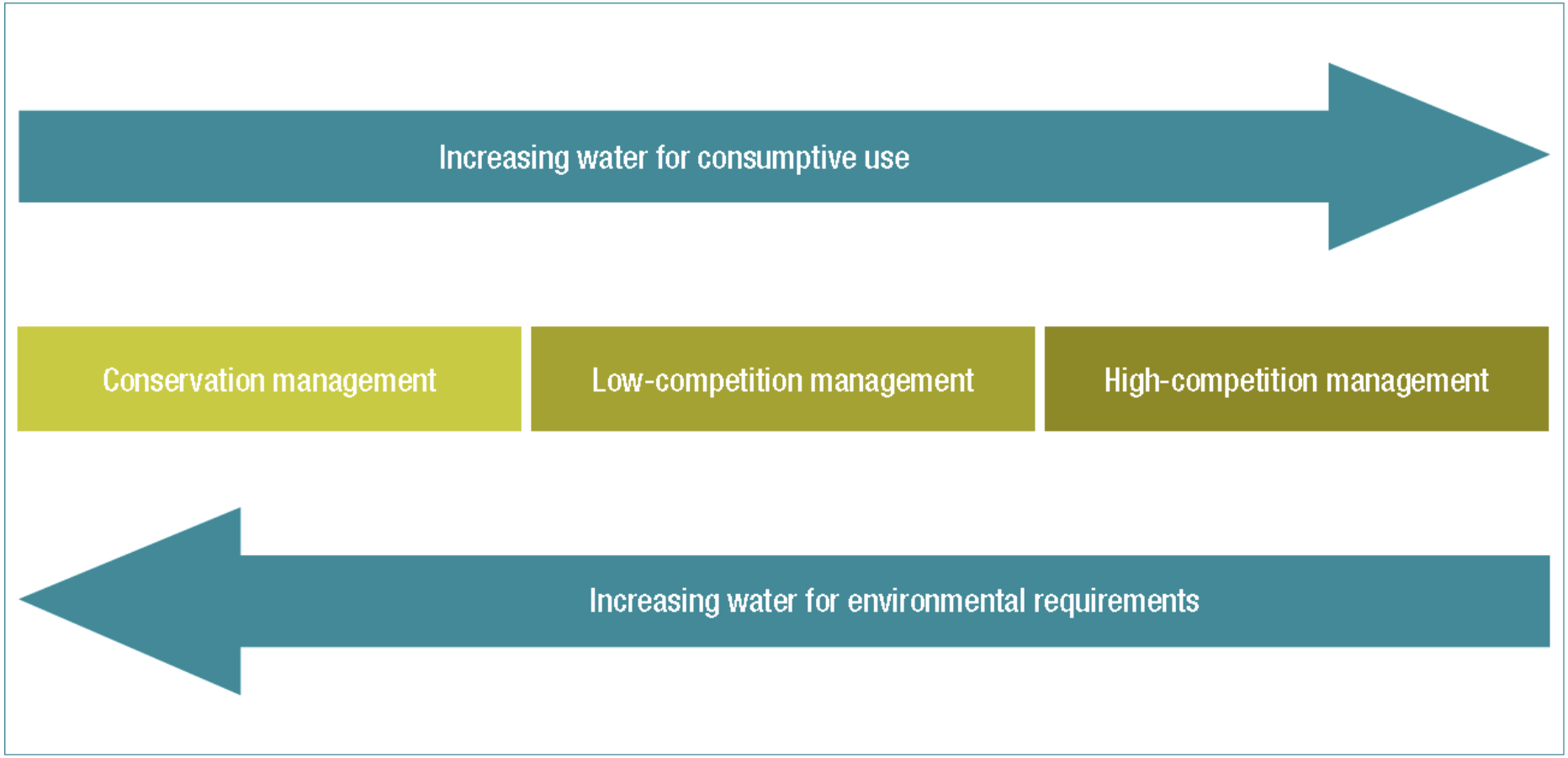
B) The FLOWS method

Australian Environmental Water Management Report 2010

What is environmental water?

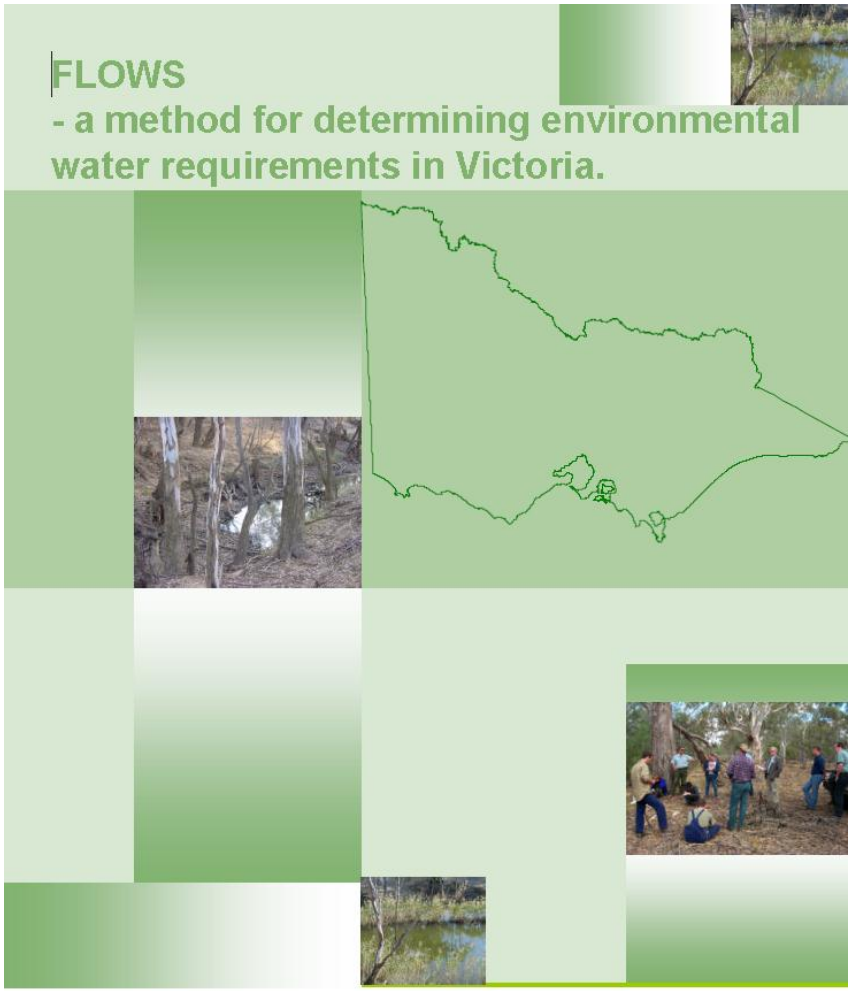
"Environmental water is the **water regime** provided to achieve **environmental objectives**"

A simplified representation of the environmental-consumptive spectrum within a water resource



The four elements of the environmental water management framework

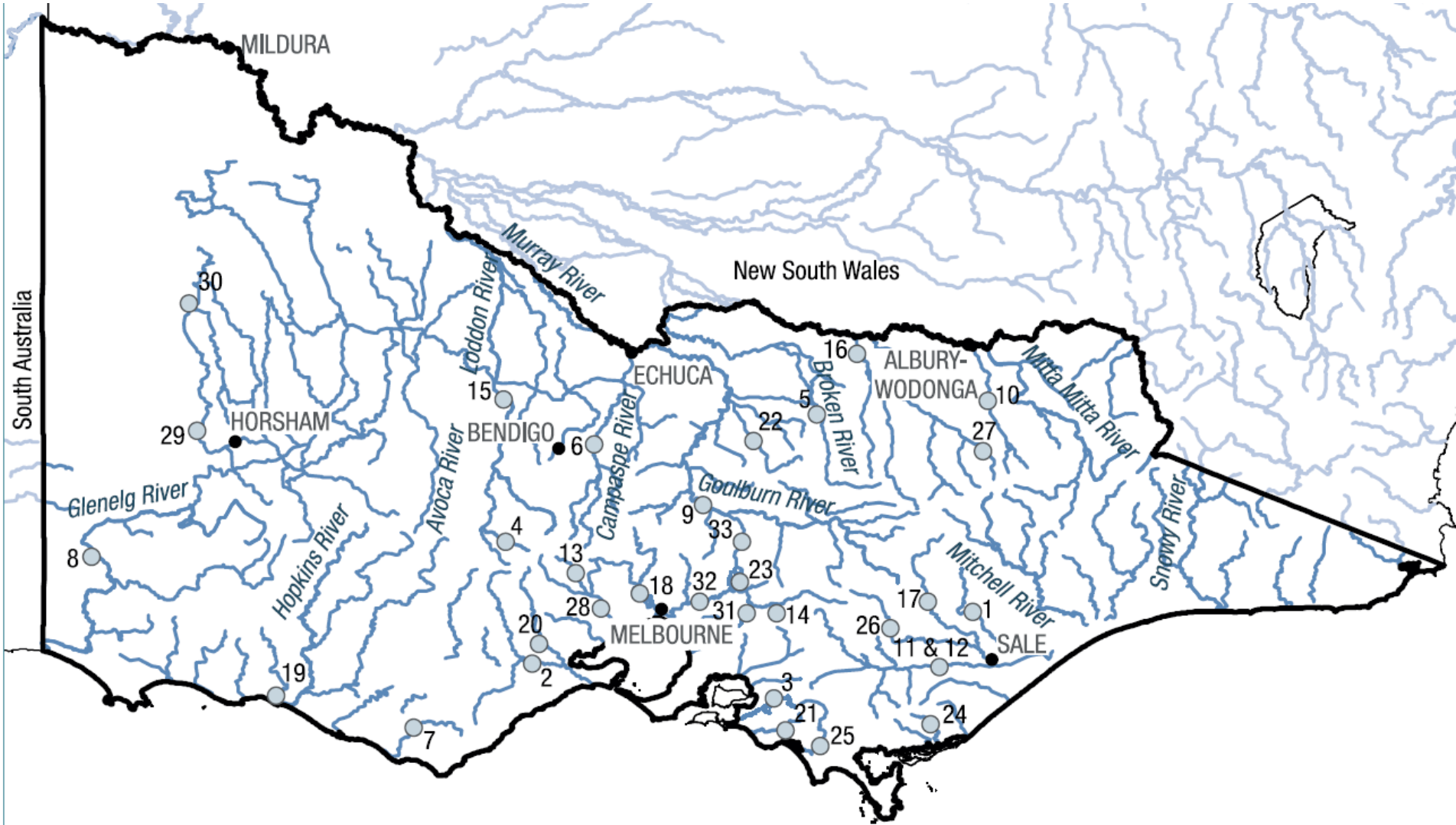
The FLOWS method

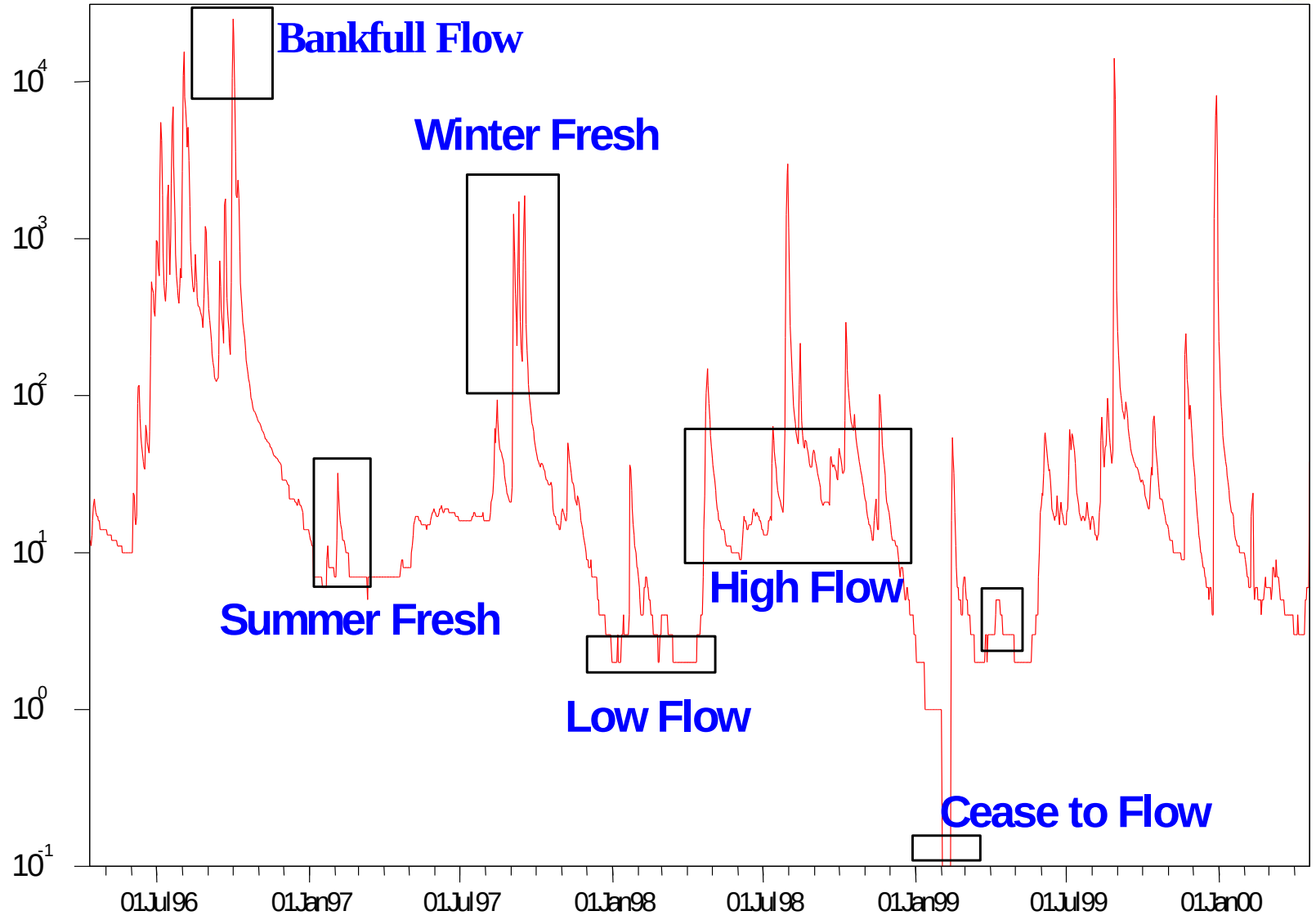


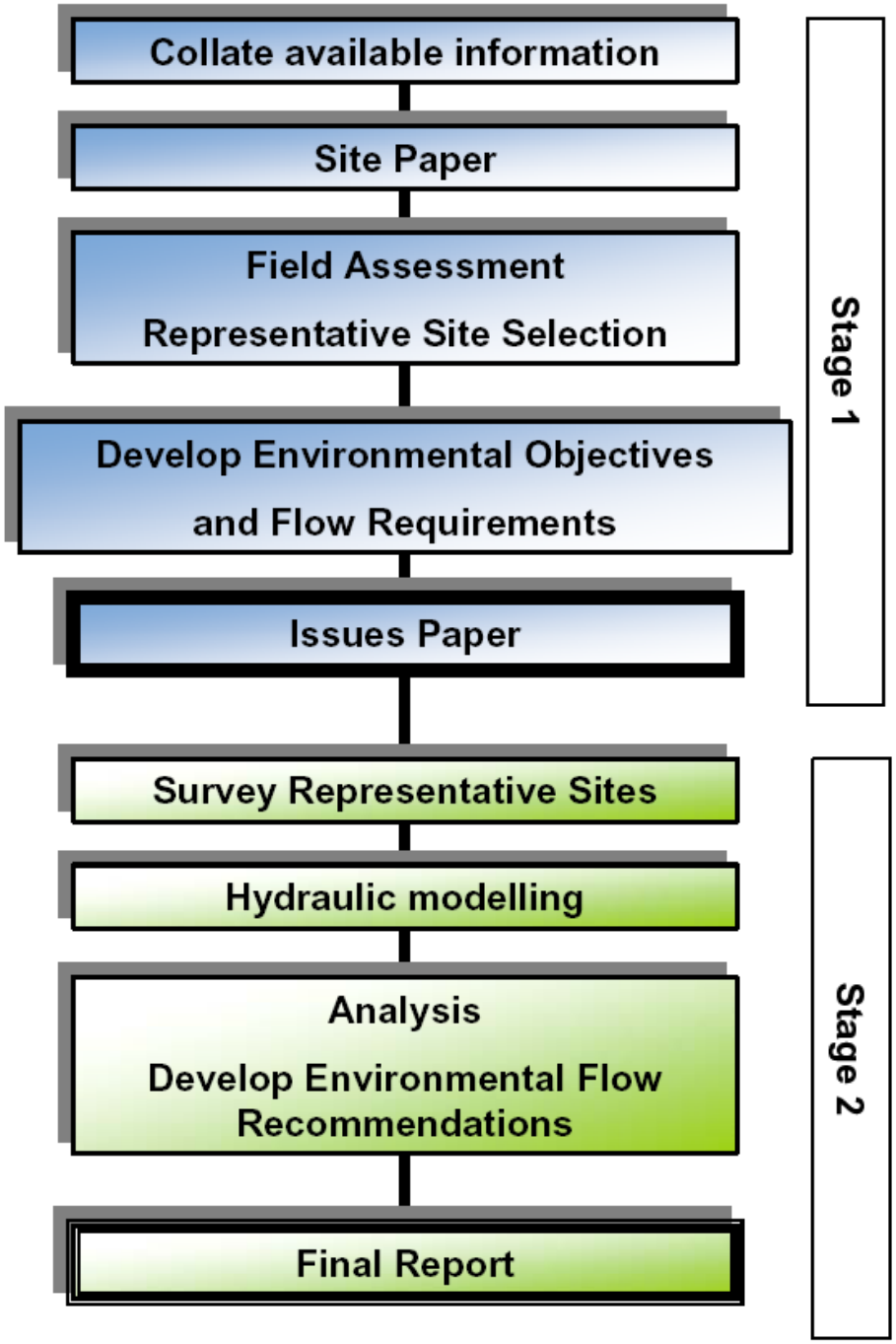
State Government Victoria
Department of Natural Resources and Environment

Victoria The Place To Be

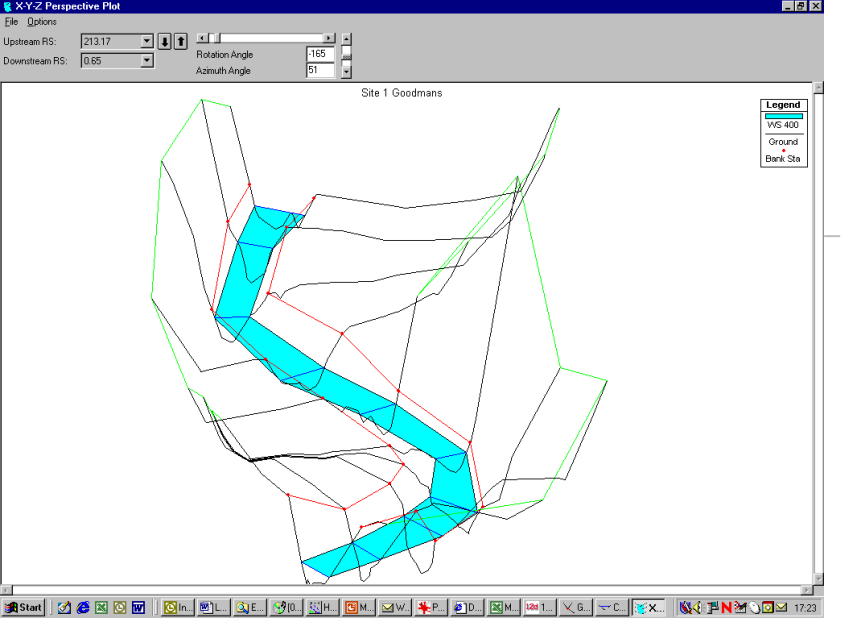
FLOWS assessments in Victoria



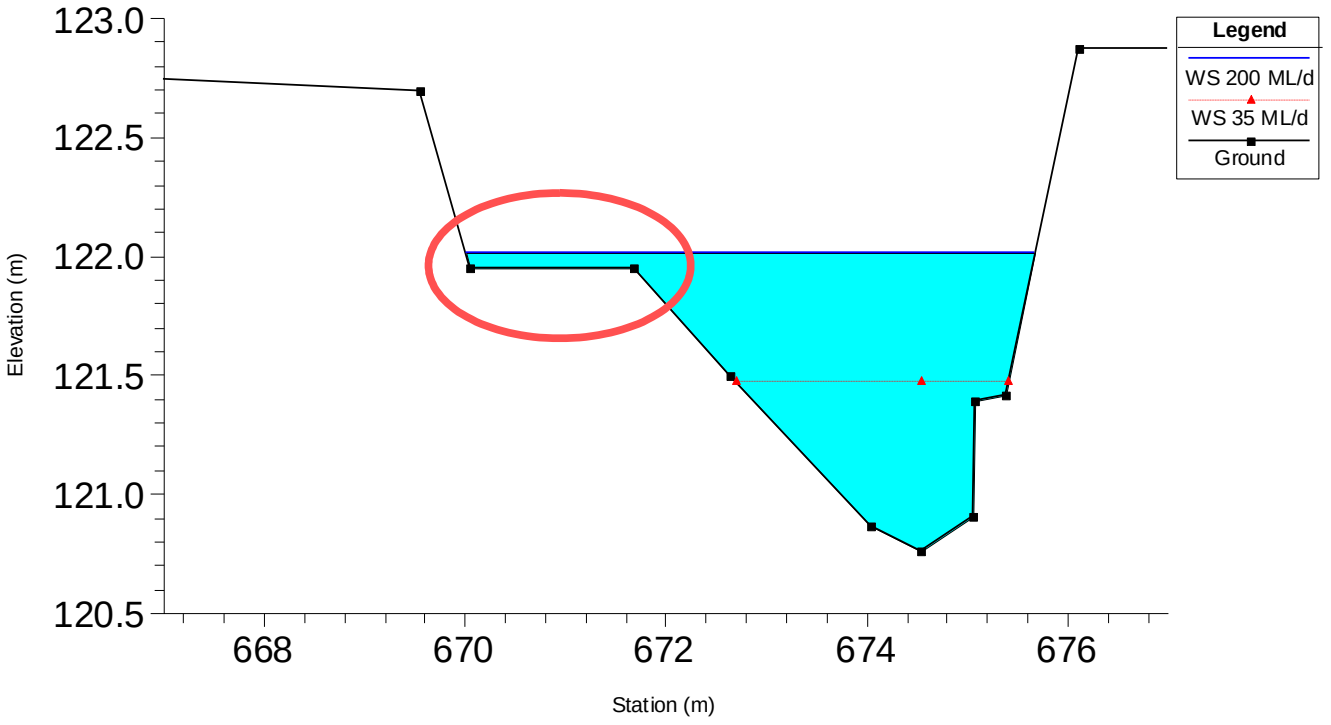

Bankfull Flow
Winter Fresh
Summer Fresh
High Flow
Low Flow
Cease to Flow
10^4
10^3
10^2
10^1
10^0
10^-1
01Jul96
01Jan97
01Jul97
01Jan98
01Jul98
01Jan99
01Jul99
01Jan00



Outline of the steps in the FLOWS method.


X-Y-Z Perspective Plot
File Options
Upstream RS: 213.17
Downstream RS: 0.65
Rotation Angle -165
Azimuth Angle 51
Site 1 Goodmans
Legend
WS 400
Ground
Bank Sta

RS = 29


123.0
122.5
122.0
121.5
121.0
120.5
Elevation (m)
668
670
672
674
676
Station (m)
Legend
WS 200 ML/d
WS 35 ML/d
Ground

River	Thomson River	Reach	Reach 2 - Thomson Dam Wall to Aberfeldy River
Compliance Point	Downstream Thomson Dam	Gauge	Thomson Dam Release

Flow				Rationale	
Season	Magnitude	Frequency	Duration	Objectives	Evaluation
Dec – Apr	Low Flow >125ML/d (or natural)	Continuous	Continuous	1a, 1b, 2a, 2b	Optimum area of habitat with water depth >0.4m over stream bed
Dec - Apr	Low Flow Freshes >230ml/d	7 per year	3 day minimum	2c, 7a	Minimum depth (0.4m) over shallowest allowing fish passage and bed sediment scouring
May – Nov	High Flow >230ml/d (or natural)	Continuous	Continuous	1a, 1b, 2a, 2b, 2c, 2e	Minimum depth (0.4m) over shallowest allowing permanent fish passage
May – Nov	High Flow Freshes >800ML/d	On average 5 per year – with at least 2 in Sep/Oct (triggered by inflows)	4 day minimum	2d, 4a, 4b, 4c, 6a, 7a	Inundate benches and litter recruitment
Any time (preference for early spring)	Bankfull Flow >2000 Ml/d	1 in2 years	3 days > 2000ML/d	2d, 4b, 4d, 6b, 7b, 9	Maintain disturbance processes and ensure riparian vegetation diversity/structure

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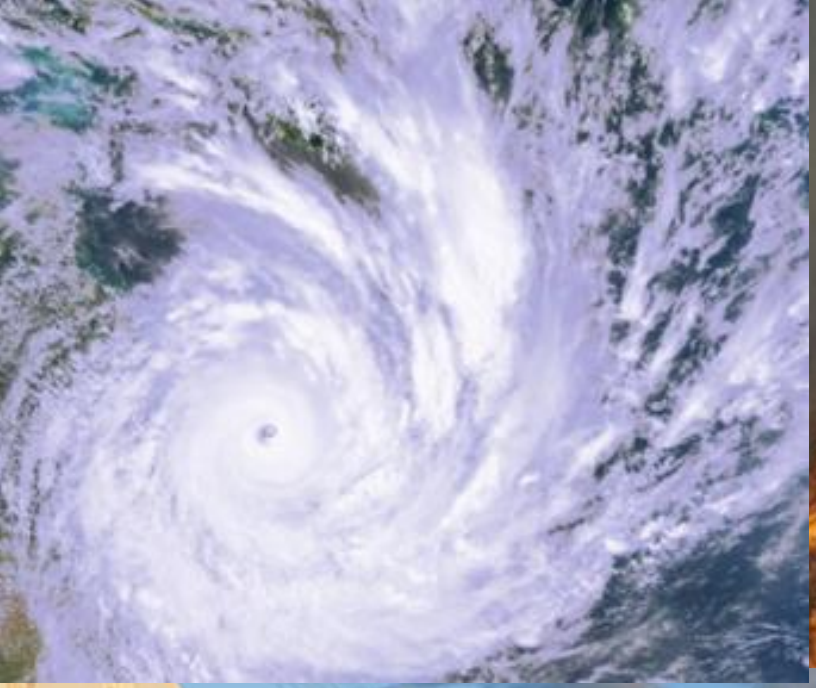


Reduction in stream flows (in Victoria) over past 10 years compared to long term average

River system	Reduction in stream flows experienced over the past 10 years	Forecast reduction in stream flows in 2055 as a result of medium climate change
Barwon	34%	28%
Moorabool	60%	32%
Werribee	51%	33%
Maribyrnong	41%	32%
Bunyip/Tarago	41%	24%
Yarra	29%	23%
Latrobe	53%	19%
Thomson/Macalister	34%	23%

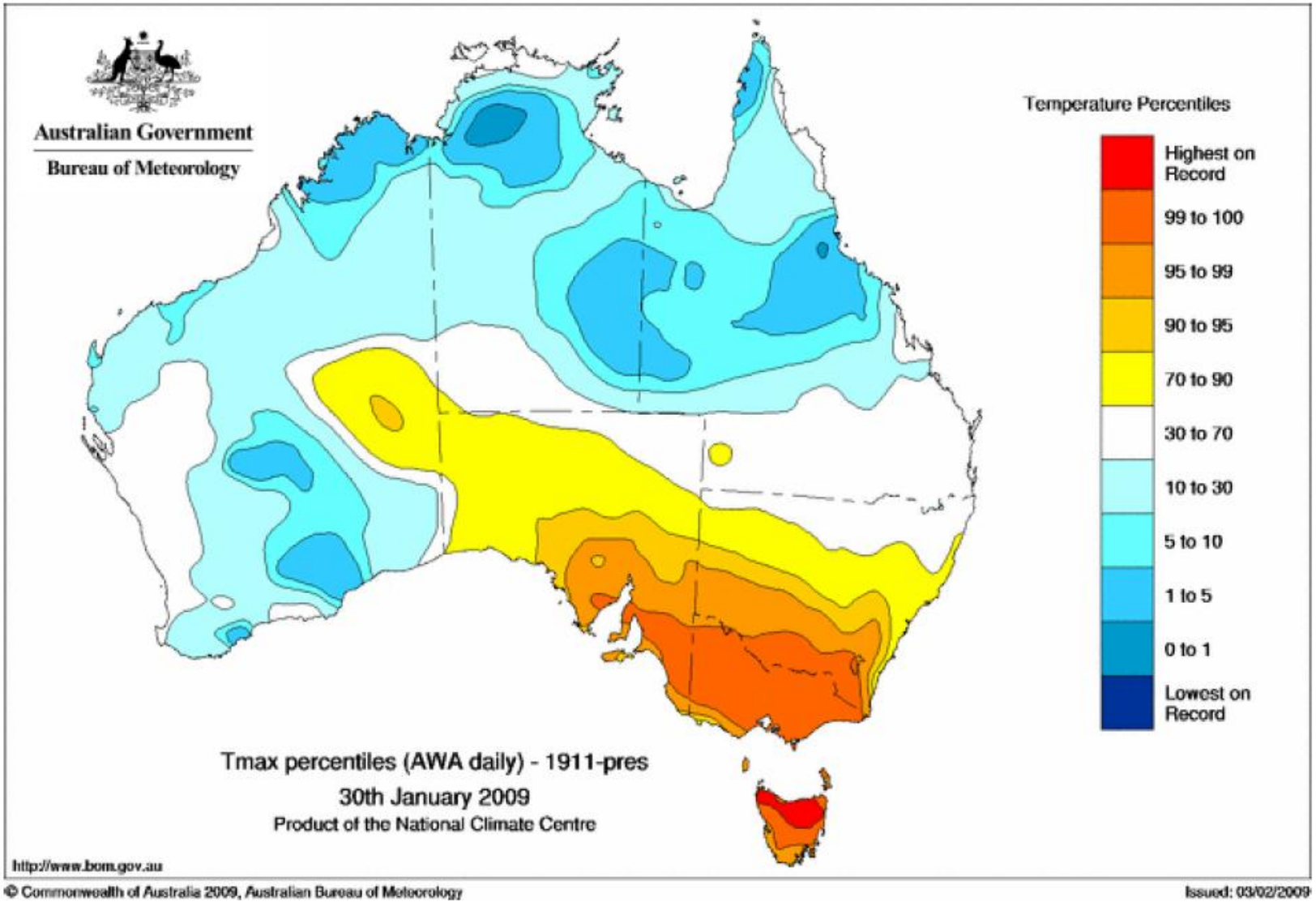


Figure 1. Australian temperature deciles for 30 January 2009, showing the large area in Tasmania which experienced its hottest day on record

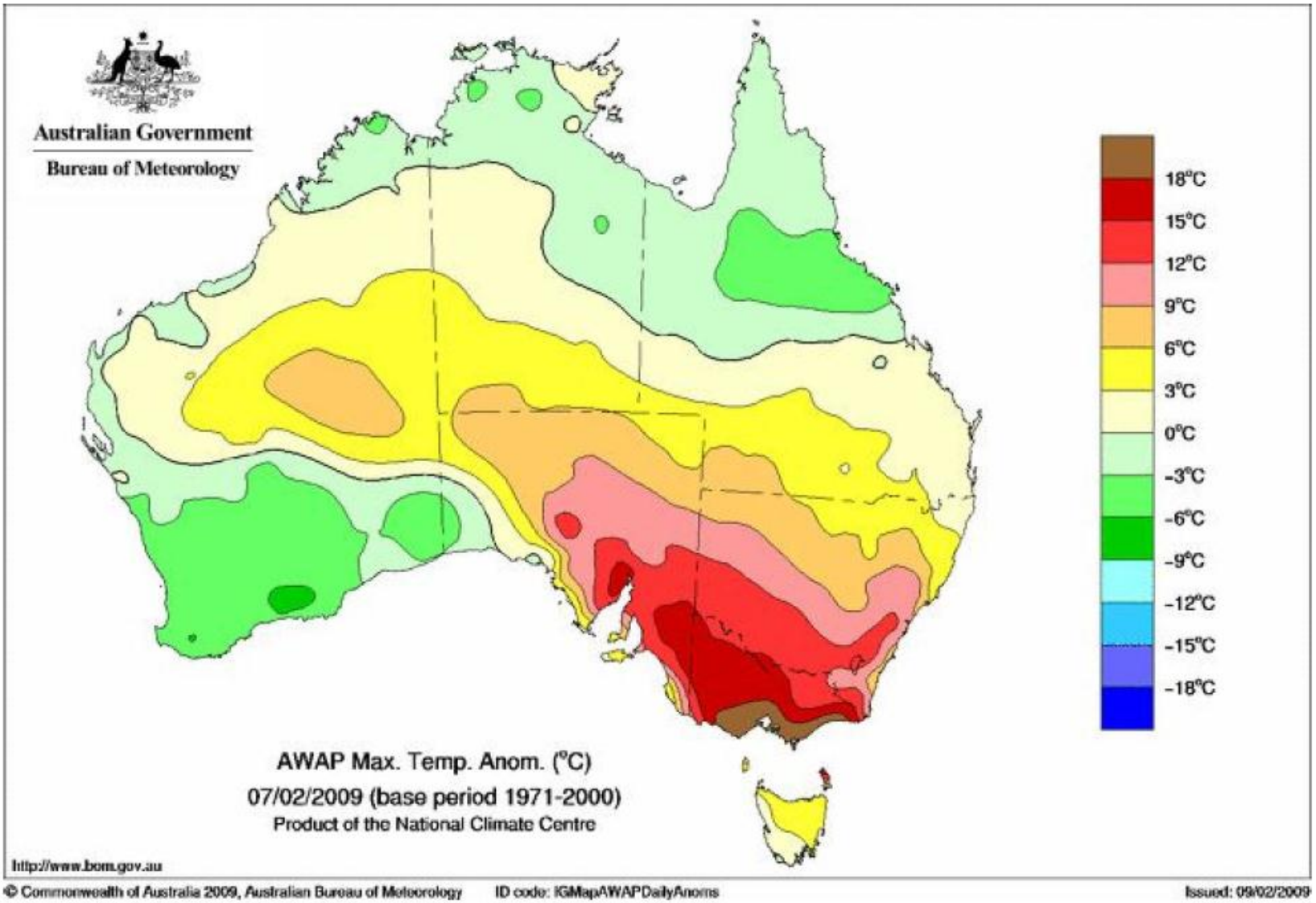
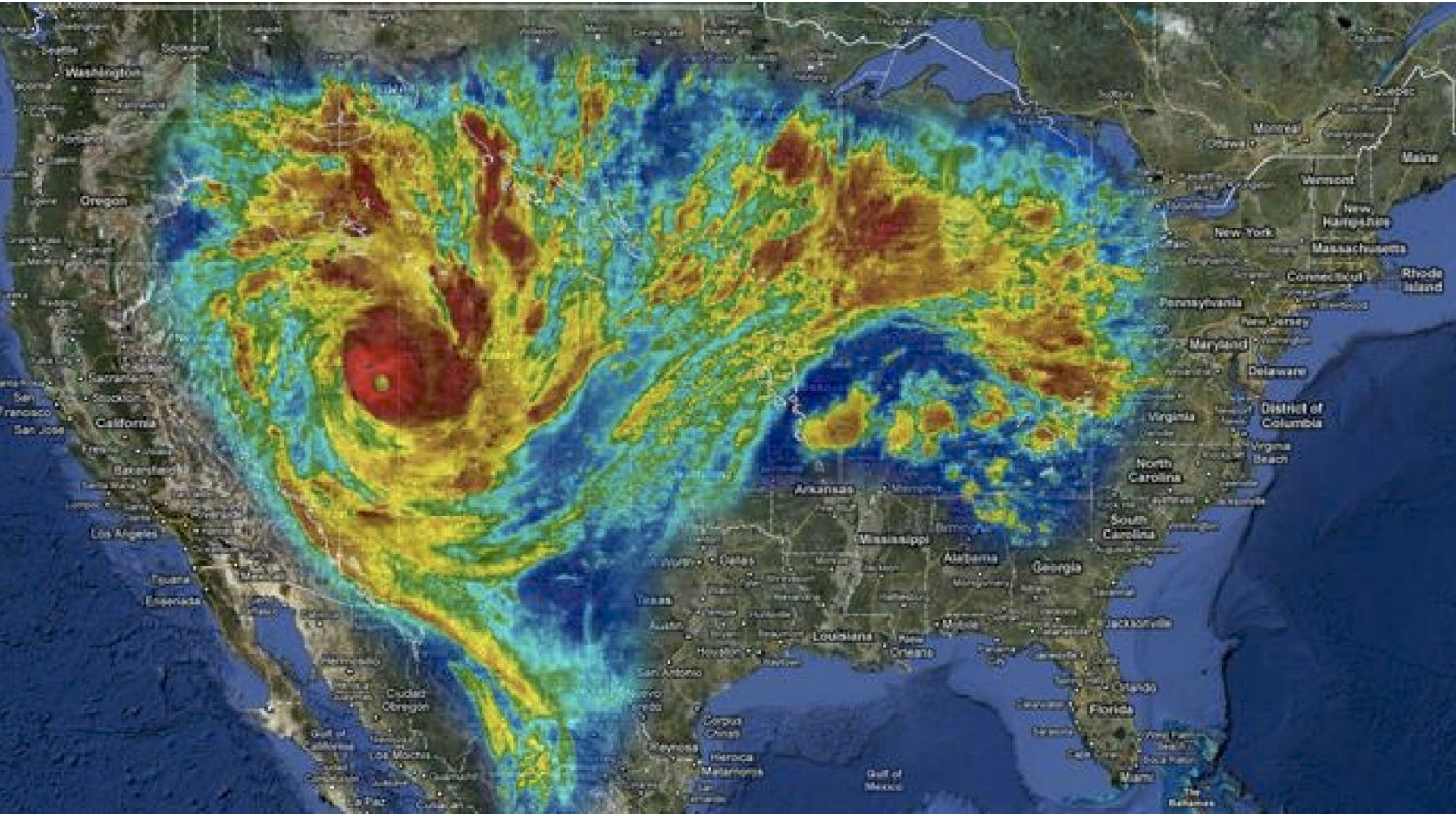


Figure 2. Maximum temperature anomalies (differences from the 1971-2000 average) for 7 February 2009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Stockton
Fresno
Bakersfield
Los Angeles
Tijuana
Ensenada
Mexicali
Ciudad Obregon
Gulf of California
Los Mochis
La Paz
Culiacan
Chihuahua
Monterrey
Reynosa
Matamoros
Corpus Christi
San Antonio
Houston
Austin
Texas
Dallas
Arkansas
Louisiana
New Orleans
Mississippi
Alabama
Mobile
Georgia
Jackonsville
Florida
Orlando
Miami
The Bahamas
Gulf of Mexico
South Carolina
North Carolina
Virginia
Virginia Beach
District of Columbia
Maryland
Delaware
Pennsylvania
New Jersey
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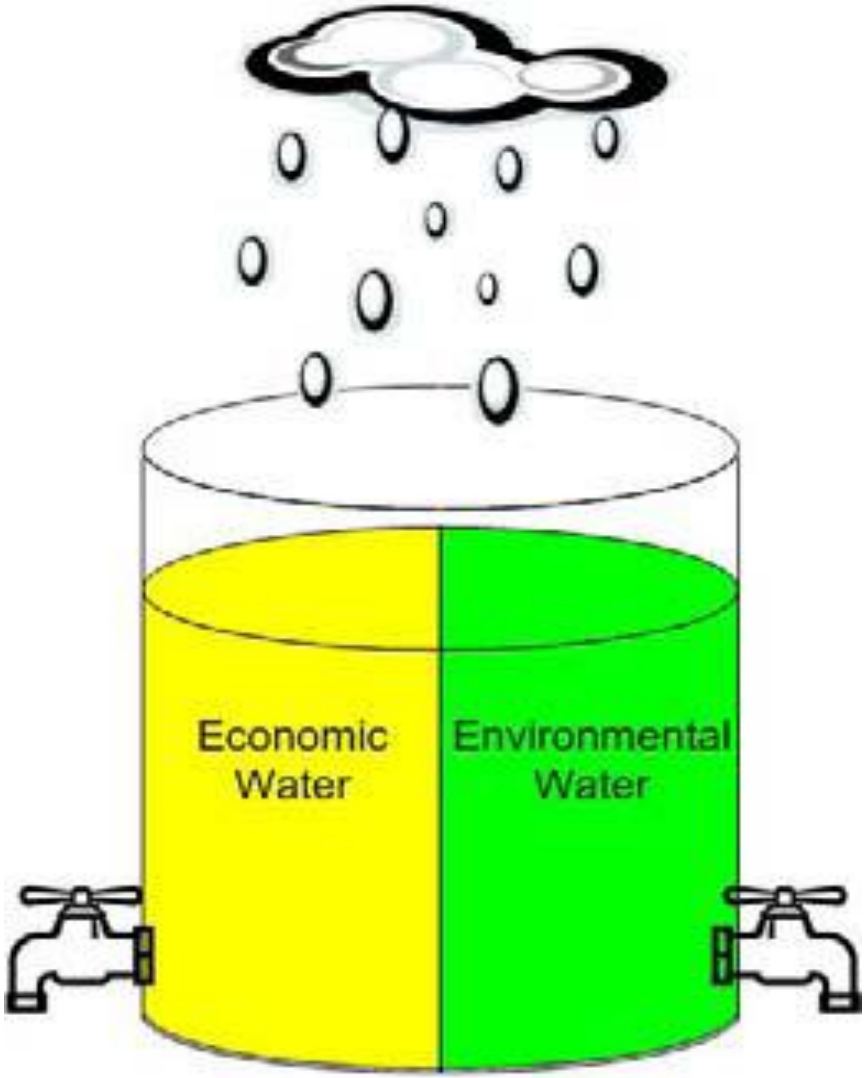
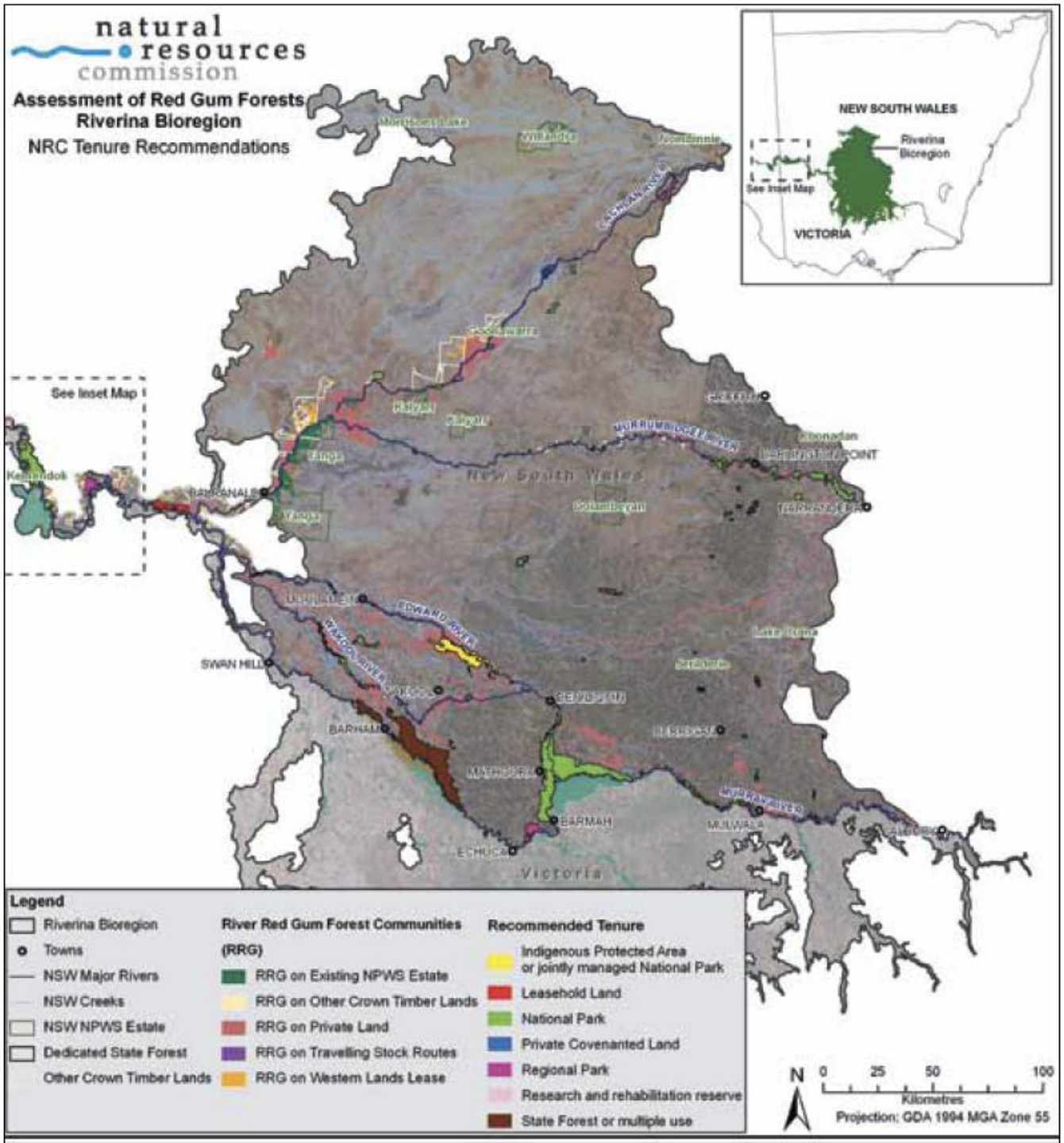
Maine
Ottawa
Montreal
Quebec

A common division of economic & environmental water




natural resources commission
Assessment of Red Gum Forests
Riverina Bioregion
NRC Tenure Recommendations
NEW SOUTH WALES
Riverina Bioregion
See Inset Map
VICTORIA
See Inset Map
New South Wales
Victoria
SWAN HILL
BARHAM
BARMAH
ECHUCA
Legend
Riverina Bioregion
Towns
NSW Major Rivers
NSW Creeks
NSW NPWS Estate
Dedicated State Forest
Other Crown Timber Lands
River Red Gum Forest Communities (RRG)
RRG on Existing NPWS Estate
RRG on Other Crown Timber Lands
RRG on Private Land
RRG on Travelling Stock Routes
RRG on Western Lands Lease
Recommended Tenure
Indigenous Protected Area or jointly managed National Park
Leasehold Land
National Park
Private Covenanted Land
Regional Park
Research and rehabilitation reserve
State Forest or multiple use
N
0 25 50 100
Kilometres
Projection: GDA 1994 MGA Zone 55

Websites

- Alluvium – www.alluvium.com.au
- NWC – www.nwc.gov.au
- Victorian Catchment Management Council.. – www.vcmc.vic.gov.au
- FLOWS method – ‘google’ it